

APPENDIX E.

Business Ownership in the Georgia Construction and Engineering-related Industries

The construction and engineering-related industries are characterized by a large number of people who own their own businesses. One out of four people working in the Georgia construction industry between 2007 and 2009 were self-employed. Fourteen percent of workers in the local engineering industry were business owners.

Focusing on these two industries, BBC examined business ownership for different racial, ethnic and gender groups in Georgia. Note that “self-employment” and “business ownership” are used as interchangeable terms in the following discussion. Firms examined include incorporated and unincorporated businesses.

Business Ownership Rates

Many studies have explored differences at the national level between minority and non-minority business ownership. Although overall self-employment rates have increased for minorities and women over time, a number of studies indicate that gender, ethnicity and race continue to affect opportunities for entrepreneurship.¹ The extent to which such individual characteristics may limit ownership opportunities differs across industries and from state to state.

BBC used Public Use Microdata Samples (PUMS) from the 1980 and 2000 U.S. Census of Population (Census) and the 2007-2009 American Community Survey 3-year estimates (ACS) to study business ownership rates in the construction and engineering industries in Georgia. BBC used historical information such as 1980 Census data to assess changes in business ownership over time.

Construction industry. Compared to other industries, construction has a large proportion of workers who are business owners. In 2007-2009, one-quarter of those in the construction industry were business owners compared with 11 percent of workers across all industries who were self-employed in Georgia.

Rates of self-employment in the Georgia construction industry vary by race, ethnicity and gender. Figure E-1 on the following page shows the percentage of workers who were self-employed in the construction industry by group for 1980, 2000 and 2007-2009 (3-year average). The table also reports corresponding sample sizes. Results for Georgia are compared with statistics for the nation.

¹ See, for example, Waldinger, Roger and Howard E. Aldrich. 1990. *Ethnicity and Entrepreneurship*. Annual Review of Sociology. 111-135.; Fairlie, Robert W. and Bruce D. Meyer. 1996. *Ethnic and Racial Self-Employment Differences and Possible Explanations*. The Journal of Human Resources, Volume 31, Issue 4, 757-793.; Fairlie, Robert W. and Alicia M. Robb. 2007. *Why are Black-Owned Businesses Less Successful than White-Owned Businesses? The Role of Families, Inheritances and Business Human Capital*. Journal of Labor Economics, 25(2), 289-323.; and Fairlie, Robert W. and Alicia M. Robb. 2006. *Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses*. Russell Sage Foundation.

Business ownership rates in 2000. The 2000 Census provides the largest sample of construction workers of any of the data sets examined. In 2000, 30 percent of non-Hispanic whites working in the Georgia construction industry were self-employed. Business ownership rates were lower for African Americans, Asian Americans and Hispanic Americans working in the local industry.

- About 9 percent of Hispanic Americans owned construction businesses, less than one-third of the rate for non-Hispanic whites and a statistically significant difference.
- African Americans had a business ownership rate of about 19 percent, a statistically significant difference from non-Hispanic whites.
- In Georgia, 20 percent of Asian Americans working in the construction industry were self-employed — lower than the rate for non-Hispanic white construction workers but not a statistically significant difference due to the sample size for Asian American workers.
- Compared with about 26 percent of men, 20 percent of women working in the construction industry in Georgia were self-employed (a statistically significant difference).

Figure E-1.

Percentage of workers in the construction industry who were self-employed, 1980, 2000 and 2007-2009

Georgia	1980	2000	2007-2009	Sample size		
				1980	2000	2007-2009
Race/ethnicity						
African American	9.2 % **	19.5 % **	19.8 % **	1,635	2,407	1,374
Asian American	18.8	19.8	29.6	16	97	101
Hispanic American	7.9 **	8.8 **	12.3 **	63	2,023	1,805
Other minority	17.2	37.5	32.0	29	148	83
Non-Hispanic white	20.7	30.3	30.6	6,437	10,963	6,927
Gender						
Female	7.8 % **	20.0 % **	18.0 % **	639	1,475	1,085
Male	19.2	26.1	25.2	7,541	14,163	9,205
All individuals	18.3 %	25.7 %	24.5 %	8,180	15,638	10,290

United States	1980	2000	2007-2009	Sample size		
				1980	2000	2007-2009
Race/ethnicity						
African American	9.0 % **	15.2 % **	18.2 % **	24,357	26,752	5,044
Asian American	10.4 **	20.7 **	23.1 **	2,604	6,471	1,857
Hispanic American	10.6 **	12.2 **	15.5 **	19,590	66,531	19,455
Other minority	11.0 **	20.3 **	20.5 **	2,819	9,563	1,789
Non-Hispanic white	19.4	25.4	27.3	281,094	371,152	78,678
Gender						
Female	9.8 % **	16.8 % **	17.4 % **	26,096	46,791	10,794
Male	18.7	23.3	24.4	304,368	433,678	96,029
All individuals	18.0 %	22.6 %	23.8 %	330,464	480,469	106,823

Note: *, ** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male groups) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level, respectively.

Source: BBC Research & Consulting from 1980 and 2000 U.S. Census 5% sample and 2007-2009 ACS Public Use Microdata samples. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Changes in business ownership rates since 2000. Between 2000 and 2007-2009, business ownership rates changed very little for non-Hispanic whites in the Georgia construction industry. Over the same period, self-employment rates for Hispanic Americans increased but continued to lag rates for all other groups. Ownership rates for African Americans grew by less than half a percentage point. A statistically significant difference remained between these minority groups and non-Hispanic whites.

- In 2007-2009, a substantially smaller proportion of Hispanic Americans (12%) than non-Hispanic whites (31%) were business owners in the Georgia construction industry (a statistically significant difference).
- The business ownership rate for African Americans was about 20 percent, a statistically significant difference from the rate for non-Hispanic whites.
- At about 30 percent, the 2007-2009 self-employment rate for Asian Americans was similar to non-Hispanic whites.
- Statistically significant differences in business ownership rates between women and men persisted in the local construction industry in 2007-2009.

Engineering industry. BBC also examined business ownership rates in the engineering industry. (In this and other marketplace appendices, the engineering industry refers to architectural, engineering and related services.) The results in Figure E-2 combine all minority groups except African Americans when analyzing business ownership rates due to small sample sizes for individual groups.

Business ownership rates in 2000. In 2000, 14 percent of non-Hispanic whites working in the Georgia engineering industry were self-employed.

- About 8 percent of African Americans and 8 percent of other minorities working in this industry in 2000 owned businesses, but these differences from non-Hispanic whites are not statistically significant due to small sample sizes for minority groups.
- During the same year, about 9 percent of women were self-employed compared with 15 percent of men in the local engineering industry (a statistically significant difference).

The differences in engineering business ownership rates in Georgia were similar to patterns found for the nation.

Changes in business ownership rates since 2000. Figure E-2 also examines business ownership rates in 2007-2009.

- There was a disparity in the business ownership rate for African Americans working in the Georgia engineering industry in 2007-2009. The ownership rate for African Americans was 7 percent – less than half the rate for non-Hispanic whites (a statistically significant difference).
- About 14 percent of other minorities working in the Georgia engineering industry in 2007-2009 owned businesses, about the same result as for non-Hispanic whites for that time period.
- Statistically significant disparities in business ownership rates persisted for women in 2007-2009.

Figure E-2.
Percentage of workers in the engineering industry who were self-employed, 1980, 200 and 2007-2009

Georgia	1980	2000	2007-2009	Sample size		
				1980	2000	2007-2009
Race/ethnicity						
African American	3.2 % **	8.1 %	6.7 % **	31	154	172
Other minority	5.9	8.3	14.3	17	99	113
Non-Hispanic white	15.9	14.2	15.4	527	1,256	1,182
Gender						
Female	3.3 % **	8.8 % **	9.3 % **	120	399	419
Male	18.0	14.6	16.0	455	1,110	1,048
All individuals	15.0 %	13.6 %	14.0 %	575	1,509	1,467
United States	1980	2000	2007-2009	Sample size		
				1980	2000	2007-2009
Race/ethnicity						
African American	5.1 % **	5.2 % **	4.0 % **	906	2,206	657
Other minority	8.4 **	8.7 **	9.4 **	2,290	7,195	2,279
Non-Hispanic white	15.8	14.2	13.5	25,673	48,823	13,801
Gender						
Female	4.5 % **	7.5 % **	7.6 % **	6,090	15,191	4,497
Male	17.7	15.1	14.2	22,779	43,033	12,240
All individuals	14.9 %	13.2 %	12.5 %	28,869	58,224	16,737

Note: "Other minority" includes Hispanic Americans, Asian Americans, Native Americans and other minority groups. Sample sizes for these race/ethnicity groups were too small to analyze individually. The data presented in this table include all workers in the engineering industry.

*, ** Denotes that the difference in proportions between the minority and non-Hispanic white groups (or female and male groups) for the given Census/ACS year is statistically significant at the 90% or 95% confidence level, respectively.

Source: BBC Research & Consulting from 1980 and 2000 U.S. Census 5% sample and 2007-2009 ACS Public Use Microdata samples. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Potential causes of differences in business ownership rates. Researchers have examined whether there are disparities in business ownership rates after consideration of other personal characteristics such as education and age. A number of studies have found that disparities in business ownership still exist when accounting for such neutral factors.

Some studies have concluded that access to financial capital is a strong determinant of business ownership. Researchers have consistently found a positive relationship between start-up capital and business formation, expansion and survival.² One study found that housing appreciation measured at the Metropolitan Statistical Area (MSA) level is a positive determinant of becoming self-employed.³ Unexplained differences still exist, however, when controlling for these factors.⁴

- Education has a positive effect on the probability of business ownership in most industries. However, findings from multiple studies indicate that minorities are still less likely to own a business than non-minority counterparts with the same levels of education.⁵
- Intergenerational links affect one's likelihood of self-employment. One study found that experience working for a self-employed family member increases the likelihood of business ownership for minority groups.⁶
- Time since immigration and assimilation into American society are important determinants of self-employment, but unexplained differences in minority-business ownership still exist when accounting for these factors.⁷

Race, ethnicity and gender can affect opportunities for business ownership, even when accounting for other personal characteristics such as education, age and familial ties. To further examine this topic, BBC developed multivariate statistical models to explore patterns of business ownership in Georgia. These models estimate the effect of race/ethnicity and gender on the probability of self-employment while controlling for other potentially influential factors.

² See Lofstrom, Magnus and Chunbei Wang. 2006. *Hispanic Self-Employment: A Dynamic Analysis of Business Ownership*. Working paper, Forschungsinstitut zur Zukunft der Arbeit (Institute for the Study of Labor); and Fairlie, Robert W. and Alicia M. Robb. 2006. *Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses*. Russell Sage Foundation.

³ Fairlie, Robert W. and Harry A. Krashinsky. 2006. Liquidity Constraints, Household Wealth and Entrepreneurship Revisited.

⁴ Lofstrom, Magnus and Chunbei Wang. 2006. *Hispanic Self-Employment: A Dynamic Analysis of Business Ownership*. Working paper, Forschungsinstitut zur Zukunft der Arbeit (Institute for the Study of Labor).

⁵ See Fairlie, Robert W. and Bruce D. Meyer. 1996. *Ethnic and Racial Self-Employment Differences and Possible Explanations*. The Journal of Human Resources, Volume 31, Issue 4, 757-793; and Butler, John Sibley and Cedric Herring. 1991. *Ethnicity and Entrepreneurship in America: Toward an Explanation of Racial and Ethnic Group Variations in Self-Employment*. Sociological Perspectives. 79-94.

⁶ See Fairlie, Robert W. and Alicia M. Robb. 2006. *Race, Families and Business Success: A Comparison of African-American-, Asian-, and White-Owned Businesses*. Russell Sage Foundation; and Fairlie, Robert W. and Alicia M. Robb. 2007. *Why are Black-Owned Businesses Less Successful than White-Owned Businesses? The Role of Families, Inheritances and Business Human Capital*. Journal of Labor Economics, 25(2), 289-323.

⁷ See Fairlie, Robert W. and Bruce D. Meyer. 1996. *Ethnic and Racial Self-Employment Differences and Possible Explanations*. The Journal of Human Resources, Volume 31, Issue 4, 757-793; and Butler, John Sibley and Cedric Herring. 1991. *Ethnicity and Entrepreneurship in America: Toward an Explanation of Racial and Ethnic Group Variations in Self-Employment*. Sociological Perspectives. 79-94.

Business Ownership Regression Analysis

An extensive body of literature examines whether race- and gender-neutral factors such as access to financial capital, education, age, and family characteristics (e.g., marital status) help explain differences in business ownership. This subject has also been examined in other disparity analyses. For example, prior studies in Minnesota⁸, Illinois⁹ and California¹⁰ have conducted econometric analyses investigating whether disparities in business ownership among race/ethnicity and gender groups in the combined construction and engineering industry remain after controlling for other personal characteristics. These studies have incorporated probit econometric models using PUMS data from the 2000 Census and have been among materials submitted to courts in subsequent litigation concerning state implementation of the Federal DBE Program.

BBC used similar probit regression models to predict business ownership from multiple independent or “explanatory” variables.¹¹ Independent variables include:

- Personal characteristics potentially linked to the likelihood of business ownership (age, age-squared, marital status, number of children and elderly people in the household and English-speaking ability);
- Indicators of educational attainment;
- Measures and indicators related to personal financial resources and constraints (home ownership, home value, monthly mortgage payment, dividend and interest income and additional household income from a spouse or unmarried partner); and
- Variables representing the race/ethnicity and gender of the individual.

⁸ National Economic Research Associates, Inc. 2000. *Disadvantaged Business Enterprise Availability Study*. Prepared for the Minnesota Department of Transportation.

⁹ National Economic Research Associates, Inc. 2004. *Disadvantaged Business Enterprise Availability Study*. Prepared for the Illinois Department of Transportation.

¹⁰ BBC Research & Consulting. 2007. *Availability and Disparity Study*. Prepared for the California Department of Transportation.

¹¹ Probit models estimate the effects of multiple independent or “predictor” variables in terms of a single, dichotomous dependent or “outcome” variable — in this case, business ownership. The dependent variable is binary, coded as “1” for individuals in a particular industry who are self-employed; “0” for individuals who are not self-employed. The model enables estimation of the probability that a worker in a given estimation sample is self-employed. The study team excluded observations where the Census Bureau had imputed values for the dependent variable of business ownership.

BBC developed four models using PUMS data from the 2000 Census and 2007-2009 ACS:

- A probit regression model for the Georgia construction industry in 2000 that included 12,677 observations;
- A probit regression model for the Georgia construction industry in 2007-2009 that included 9,610 observations;
- A probit regression model for the Georgia engineering industry in 2000 that included 1,329 observations; and
- A probit regression model for the Georgia engineering industry in 2007-2009 that included 1,369 observations.

Results specific to the Georgia construction industry. BBC developed probit regression models of business ownership in the Georgia construction industry for 2000 and 2007-2009.

Georgia construction industry in 2000. Figure E-3 presents the coefficients and t-statistics for the 2000 probit model for individuals working in the Georgia construction industry.

The model indicates that several neutral factors were important and statistically significant in predicting the probability of business ownership for workers in this industry:

- Older individuals were more likely to be business owners;
- Married individuals were more likely to be business owners;
- The number of children in the worker's household was positively associated with business ownership;
- The number of elderly (people over 65) in the worker's household was negatively associated with business ownership;
- Home ownership and the value of the home owned by the worker were both associated with higher probability of business ownership;
- Greater income from a spouse or partner increased workers' likelihood of owning a business;
- The ability to speak English well increased the probability of business ownership; and
- A four-year degree decreased the likelihood of being self-employed in the construction industry in 2000.

After controlling for neutral factors in the 2000 data, statistically significant disparities in rates of business ownership remained for African Americans, Hispanic Americans and women working in the Georgia construction industry. Figure E-3 below shows these results.

Figure E-3.
Georgia construction industry business ownership model, 2000

Variable	Coefficient	t-statistic
Constant	-2.6397	-14.67 **
Age	0.0529	6.95 **
Age-squared	-0.0004	-4.24 **
Married	0.0836	2.29 **
Disabled	-0.0683	-1.51
Number of children in household	0.0717	4.96 **
Number of people over 65 in household	-0.1368	-2.83 **
Owns home	0.0765	1.91 *
Home value (\$000s)	0.0012	6.62 **
Monthly mortgage payment (\$000s)	-0.0294	-0.83
Interest and dividend income (\$000s)	0.0002	0.10
Income of spouse or partner (\$000s)	0.0013	2.30 **
Speaks English well	0.4692	4.81 **
Less than high school education	-0.0390	-1.10
Some college	0.0440	1.18
Four-year degree	-0.1045	-1.83 *
Advanced degree	-0.1147	-1.05
African American	-0.3258	-7.21 **
Asian American	-0.1548	-0.84
Hispanic American	-0.2857	-3.81 **
Other minority	0.2987	2.18 **
Female	-0.3782	-7.45 **

Note: *,** Denote statistical significance at the 90% and 95% confidence levels, respectively.

Source: BBC Research & Consulting from 2000 U.S. Census 5% sample. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

The probit modeling approach allows for simulation of business ownership rates for minorities and females as if they had the same probability of self-employment as similarly situated non-Hispanic whites and males, respectively. To conduct this next step in the analysis, BBC performed a probit regression predicting business ownership using only non-Hispanic white (or non-Hispanic white male) construction workers in the dataset.¹² The study team then applied the coefficients from this version of the model to the mean characteristics of minorities (or women) working in the Georgia construction industry to estimate the probability of business ownership in the absence of any racial/ethnic (or gender) differences in the likelihood of self-employment.

BBC performed these calculations for only those groups where race/ethnicity or gender was a statistically significant negative factor in business ownership (as shown in Figure E-3).

¹² This version of the model excludes the race/ethnicity indicator variables since the value for all of those variables would be the same.

Figure E-4 shows these simulated (“benchmark”) business ownership rates, comparing them to the actual, observed mean probability of business ownership for African Americans, Hispanic Americans and non-Hispanic white women. Similar simulation approaches have been incorporated in other disparity studies reviewed by courts.

Comparing actual, observed mean self-employment rates of African Americans in the Georgia construction industry with a benchmark based on business ownership rates of non-Hispanic white construction workers, there were about 66 percent as many African American-owned businesses as would be expected. Hispanic Americans (disparity index of 62) also owned businesses at rates substantially lower than would be expected compared to the average business ownership rates of non-Hispanic white construction workers. To focus on the effects of gender, BBC’s analysis compared actual and predicted rates for non-Hispanic white women — white women working in the local construction industry owned businesses at rates substantially lower than would be expected (disparity index of 66).

Figure E-4.
Comparison of actual business ownership rates to simulated rates for Georgia construction workers, 2000

Group	Self-employment rate		Disparity index (100 = parity)
	Actual	Benchmark	
African American	18.6%	28.3%	66
Hispanic American	8.9%	14.4%	62
White female	23.0%	34.6%	66

Note: As the benchmark figure can only be estimated for records with an observed (rather than imputed) dependent variable, comparison is made with only this subset of the sample. For this reason, actual self-employment rates may differ slightly from those in Figure E-1.

Source: BBC Research & Consulting from 2000 U.S. Census 5% sample. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Georgia construction industry in 2007-2009. Figure E-5 presents the coefficients and t-statistics from the probit model predicting business ownership in the Georgia construction industry in 2007-2009.

From the 2007-2009 model, it appears that many of the same neutral factors important in predicting business ownership in the 2000 model also had an impact in 2007-2009. Increased age, higher home value and higher income of a spouse or partner are associated with a greater likelihood of self-employment. Although not significant in 2000, higher interest and dividend income was associated with higher likelihood of business ownership in 2007-2009. The importance of educational attainment to ownership of a construction business persisted as well, with attainment of a four-year degree as a statistically significant predictor of business ownership in 2007-2009.

After controlling for neutral factors, a statistically significant difference persisted in the rates of business ownership for African American, Hispanic American and female construction workers.

Figure E-5.
Georgia construction industry business ownership model, 2007-2009

Variable	Coefficient	t-statistic
Constant	-2.3946	-8.93 **
Age	0.0519	5.05 **
Age-squared	-0.0003	-2.90 **
Married	0.0294	0.60
Number of children in household	0.0261	1.54
Number of people over 65 in household	-0.0125	-0.26
Owns home	0.0521	1.06
Home value (\$000s)	0.0010	7.07 **
Monthly mortgage payment (\$000s)	0.0143	0.47
Interest and dividend income (\$000s)	0.0040	2.39 *
Income of spouse or partner (\$000s)	0.0014	2.34 *
Speaks English well	0.1524	1.22
Less than high school education	0.0418	0.95
Some college	-0.0133	-0.31
Four-year degree	-0.1877	-3.07 **
Advanced degree	-0.2621	-2.09
African American	-0.2092	-4.28 **
Asian American	-0.1610	-0.90
Hispanic American	-0.3017	-3.67 **
Other minority	0.1879	0.94
Female	-0.5263	-10.74 **

Note: *,** Denote statistical significance at the 90% and 95% confidence levels, respectively.

Source: BBC Research & Consulting from 2007-2009 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Using the same approach as for the 2000 data, the study team used the 2007-2009 results to simulate business ownership rates if minorities and women had the same probability of self-employment as similarly situated non-Hispanic whites and non-Hispanic white males, respectively. Figure E-6 shows actual and simulated (“benchmark”) business ownership rates for Hispanic American and white women construction workers in Georgia. Again, BBC performed these calculations for only those groups where race/ethnicity or gender was a statistically significant factor in business ownership (as shown in Figure E-5).

In 2007-2009, there were about 76 percent as many African American-owned businesses as would be expected, up from 66 percent in 2000. Hispanic Americans had an actual, observed self-employment rate of about 12 percent, substantially lower than the predicted rate of 25 percent from the study team’s simulation. This translates into a disparity index of 50, which suggests that nearly twice as many Hispanic American construction workers would be business owners if they had the same self-employment rate as similarly situated non-Hispanic whites.

Results in 2007-2009 for women were similar to those in 2000. Based on the simulation, about 37 percent of white women would own businesses in the construction industry if gender did not have an impact on self-employment. However, the actual 2007-2009 self-employment rate for women was 20 percent (disparity index of 56).

Figure E-6.
Comparison of actual business ownership rates to
simulated rates for Georgia construction workers, 2007-2009

Group	Self-employment rate		Disparity index (100 = parity)
	Actual	Benchmark	
African American	21.2%	28.0%	76
Hispanic American	12.3%	24.8%	50
White female	20.4%	36.7%	56

Note: As the benchmark figure can only be estimated for records with an observed (rather than imputed) dependent variable, comparison is made with only this subset of the sample. For this reason, actual self-employment rates may differ slightly from those in Figure E-1.

Source: BBC Research & Consulting from 2007-2009 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Results specific to the Georgia engineering industry. BBC developed a separate business ownership model for the engineering industry using 2000 Census data and 2007-2009 ACS data for Georgia. As with ownership rates in the engineering industry, individual minority groups other than African Americans were combined into a single “other minority” category.

Georgia engineering industry in 2000. Figure E-7 presents the coefficients and t-statistics from the probit model predicting business ownership in the Georgia engineering industry in 2000.

The following neutral factors were statistically significant in predicting business ownership for the engineering industry in Georgia in 2000:

- Higher home values (for homeowners) were associated with a greater likelihood of business ownership; and
- Lower mortgage payments (for homeowners) were associated with higher rates of self-employment.

After accounting for neutral factors, the Georgia engineering model for 2000 indicated that minorities and women had lower rates of business ownership but that the differences were not statistically significant.

Figure E-7.
Georgia engineering industry business ownership model, 2000

Variable	Coefficient	t-statistic
Constant	-2.6785	-3.87 **
Age	0.0243	0.86
Age-squared	0.0000	0.13
Married	0.1166	0.85
Disabled	0.0870	0.47
Number of children in household	0.0696	1.27
Number of people over 65 in household	0.0377	0.26
Owens home	0.0969	0.58
Home value (\$000s)	0.0017	3.81 **
Monthly mortgage payment (\$000s)	-0.2763	-3.03 **
Interest and dividend income (\$000s)	0.0026	0.90
Income of spouse or partner (\$000s)	0.0011	0.96
Speaks English well		
Less than high school education	0.4696	1.40
Some college	0.1508	0.74
Four-year degree	0.2709	1.33
Advanced degree	0.0085	0.04
African American	-0.0674	-0.35
Other minority	-0.2935	-1.19
Female	-0.2118	-1.63

Note: *,** Denote statistical significance at the 90% and 95% confidence levels, respectively.

"Speaks English well" exhibits perfect collinearity. Thus it was dropped from the regression.

Source: BBC Research & Consulting from 2000 U.S. Census 5% sample. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Georgia engineering industry in 2007-2009. Figure E-8 presents the coefficients and t-statistics from the probit model predicting business ownership in the Georgia engineering industry in 2007-2009.

As with the 2000 model, higher home values were important in predicting business ownership in the engineering industry in 2007-2009. No other neutral factors were significant in the 2007-2009 model.

- When holding neutral factors constant, the Georgia engineering model for 2007-2009 indicates that women and African Americans working in the industry were less likely than men and non-Hispanic whites to own businesses. However, these differences were not statistically significant.
- In contrast to the construction industry, race/ethnicity and gender were not statistically significant predictors of business ownership in the engineering-related field.

Figure E-8.
Georgia engineering industry business ownership model, 2007-2009

Variable	Coefficient	t-statistic
Constant	-2.8385	-4.34 **
Age	0.0237	0.84
Age-squared	0.0000	0.07
Married	0.1724	1.30
Number of children in household	0.1106	2.02
Number of people over 65 in household	0.1339	0.96
Owns home	0.0298	0.19
Home value (\$000s)	0.0014	4.66 **
Monthly mortgage payment (\$000s)	-0.0655	-1.01
Interest and dividend income (\$000s)	0.0002	0.11
Income of spouse or partner (\$000s)	0.0000	-0.03
Speaks English well		
Less than high school education		
Some college	0.1438	0.83
Four-year degree	0.2386	1.58
Advanced degree	-0.0555	-0.29
African American	-0.1730	-0.84
Other minority	0.0404	0.24
Female	-0.1925	-1.36

Note: **, * Denote statistical significance at the 90% and 95% confidence levels, respectively.

"Speaks English well" and "Less than high school education" both exhibit perfect collinearity. Both were dropped from the regression.

Source: BBC Research & Consulting from 2007-2009 ACS data. The raw data extract was obtained through the IPUMS program of the MN Population Center: <http://usa.ipums.org/usa/>.

Summary of Business Ownership in the Construction and Engineering Industries

Disparities in business ownership were present in the Georgia construction industry:

- In both 2000 and 2007-2009, business ownership rates for African Americans and Hispanic Americans were substantially lower than that of non-Hispanic whites (statistically significant differences). Business ownership rates were lower for Asian Americans as well, but this difference was not statistically significant in part due to small sample size of Asian Americans in the datasets.
- After statistically controlling for a number of neutral factors affecting business ownership, substantially fewer minorities owned firms than would be expected if they owned businesses at the same rate as similarly situated non-minorities. This was true for African Americans and Hispanic Americans working in the local construction industry in both 2000 and 2007-2009 (statistically significant differences).
- In 2000 and in 2007-2009, women working in the local construction industry had substantially lower rates of business ownership than men. Statistically significant disparities persisted for women after controlling for a number of neutral factors.

BBC also identified disparities in business ownership in the engineering industry:

- African Americans working in the Georgia engineering industry were self-employed at substantially lower rates than non-Hispanic whites in both 2000 and 2007-2009. (This difference was statistically significant in the 2007-2009 data only). Business ownership rates were also lower for other minorities, but this difference was not statistically significant in part due to small sample sizes of these groups.
- In 2000 and in 2007-2009, women working in the engineering industry in Georgia also had substantially lower self-employment rates than men (statistically significant differences).
- BBC used regression models to investigate the presence of race/ethnicity and gender disparities in business ownership in the engineering industry after accounting for the effects of neutral factors. Analyses for 2000 and 2007-2009 did not identify statistically significant disparities for minorities and women.